

## Workshop: Longitudinal data analysis: Sequence analysis and growth curve models

*This course will be divided into two days. Sequence analysis will be introduced on the first day, and growth curve models on the second.*

**3rd Term, Academic Year 2022-2023**

**Dates:**

**8 June 2023 (9:00-16:00)**

**9 June (9:00-18:00)**

**Instructor: Lucas Sage (Max Weber Fellow) & Giacomo Vagni (Max Weber Fellow and SPS Part time professor)**

**Supervising professor: Juho Härkönen**

### Introduction to Sequence Analysis

Instructor: Giacomo Vagni

email: [giacomo.vagni@eui.eu](mailto:giacomo.vagni@eui.eu)

---

### Description

This course will introduce students to sequence analysis in the social sciences. Sequence analysis is a descriptive statistical method designed for studying longitudinal categorical outcomes, such as employment trajectories.

Students will learn the main tools for analysing sequences such as how to calculate distance between sequences, cluster analysis, and discrepancy analysis. Students will also learn how to visualise sequences.

The course will consist of a 3-hour lecture and a 2-hour lab using R.

By the end of the course, students will have acquired the skills to read and interpret the quantitative content of sequence analysis papers and perform basic analysis of sequences.



## Timetable

<i>Hours</i>	<i>Topic</i>
1	Introduction
2	Visualising sequence, dissimilarity
3	Clustering, typology, discrepancy analysis
3	<i>Lab</i>
4	<i>Lab</i>

## Core Readings

Gabadinho, A., Ritschard, G., Mueller, N. S., & Studer, M. (2011). Analyzing and visualizing state sequences in R with TraMineR. *Journal of statistical software*, 40(4), 1-37.

Lesnard, L. (2010). Setting cost in optimal matching to uncover contemporaneous socio-temporal patterns. *Sociological methods & research*, 38(3), 389-419.

Studer, M., & Ritschard, G. (2016). What matters in differences between life trajectories: A comparative review of sequence dissimilarity measures. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, 481-511.

Cornwell, B. (2015). *Social sequence analysis: Methods and applications*. Cambridge University Press.

# Multilevel growth curve models

Instructor: Lucas Sage

email: [lucaschristophemarc.sage@eui.eu](mailto:lucaschristophemarc.sage@eui.eu)

---

## Description

This course will serve as an introduction to growth curve analysis (GCA). GCA has become an increasingly popular method in analysis of longitudinal data in sociology, psychology, and related fields. It can be used to analyze the development of continuously measured outcomes (such as earnings, occupational prestige, grades, or psychological well-being) and how these trajectories vary between individuals. This course will be limited to the multilevel GCA framework.

During this course, we will briefly recap the basic concepts of multilevel models (notably random intercept and random slopes). We will then see how they can be applied to longitudinal data to describe individual change over time. This will be followed by a lab session in which students will learn how to implement multilevel GCA in R.

The course will be divided into a 2.5-hour lecture and a 2.5-hour lab.

After this course, students will be able to read and understand scientific articles using GCA, and to perform basic multilevel GCA. Familiarity with R and multilevel models are additional assets.

## Core reading

(Most important ones in bold.)

**Cheng, Siwei.** 2014. "A Life Course Trajectory Framework for Understanding the Intracohort Pattern of Wage Inequality." *American Journal of Sociology* 120(3):633–700.

Curran, Patrick J., Khawla Obeidat, and Diane Losardo. 2010. "Twelve Frequently Asked Questions About Growth Curve Modeling." *Journal of Cognition and Development* 11(2):121–36. doi: 10.1080/15248371003699969.

Manzoni, A., J. Harkonen, and K. U. Mayer. 2014. "Moving On? A Growth-Curve Analysis of Occupational Attainment and Career Progression Patterns in West Germany." *Social Forces* 92(4):1285–1312. doi: 10.1093/sf/sou002.

Rabe-Hesketh, Sophia, and Anders Skrondal. 2008. *Multilevel and Longitudinal Modeling Using Stata*. STATA press.

**Singer, Judith D., and John B. Willett.** 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford ; New York: Oxford University Press. Chap. 1-5.

Steele, Fiona. 2008. "Multilevel Models for Longitudinal Data." *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 171(1):5–19.